THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND
ENVIRONMENTAL AFFAIRS
Department of Agricultural Resources
251 Causeway Street, Suite 500, Boston, MA 02114
617-626-1700 fax 617-626-1850 www.Mass.gov/AGR

TO: West Nile Virus (WNV) Contact Person

FROM: Mark S. Buffone, Department of Agricultural Resources-Pesticide Bureau, WNV Municipal Larvicide Training and Permit Program

DATE: Spring/Summer 2008

SUBJECT: 2008 WNv Permits

Introduction
As the designated West Nile Virus Contact Person for your municipality, I have enclosed the 2008 WNV Permits for your employees and staff since the Department of Agricultural Resources (DAR) has received documentation that verifies you have or had not used larvicide's during 2007.

These permits apply to any personnel who has been trained and tested in any year from 2000 through 2007.

If a person who, according to our records, is eligible to receive a permit *BUT no longer works at your Agency or Department, please send back the permit(s) to the above address to my attention with a letter detailing the situation***.**

Please distribute the 2008 permit only to the individual named on the permit. They MUST sign it and carry on their person whenever applying a larvicide (similar to carrying a driver's license when driving).

Note: This time-limited permit, allows the named employee to apply ONLY dry formulations of specific mosquito larvicides in catch basins of the community in which he or she is employed.

WNv Larvicide Program Requirements

Each municipality involved in the WNv larvicide program must:

1. Designate a contact person: Title, Address, Telephone Number, and E-mail.
Note: If the Contact Person previously designated has changed, please notify me (see address below).
Mark S. Buffone
West Nile Virus Permit Program
Department of Agricultural Resources-Pesticide Bureau
251 Causeway Street; Suite 500
Boston, MA 02114-2151

2. Submit larvicide USE REPORT report information OR **letter stating that no larvicides were used during the 2007 mosquito season.**

3. Verify and list that at least one (1) person holds a regular Massachusetts pesticide certification or license. Note: The Department strongly encourages permanent licensing of all employees using larvicides, as this unique larvicide permitting program for municipalities may not be available in future years. **The permits issued for any year are not a regular pesticide certification or license.** Permanent licensing information can be obtained by going to the following website: http://www.state.ma.us/dfa/pesticides/)

4. Municipal employees who do not hold a regular pesticide applicator certificate may obtain a WNv permit by successfully completing a one-time training and examination. In other words, any municipal employee who has a regular pesticide certification or license, or has previously received a municipal WNv larviciding permit is not currently required to undergo re-training and re-testing (though this may change in future years).

5. Contact Person MUST COMPLETE the USE REPORT FORM **(click on link below)**

http://www.mass.gov/agr/mosquito/docs/WNV_Use_Report_Form.pdf

For more information on mosquito control go to the Mosquito Control Website **(click on link below)**

http://www.mass.gov/agr/mosquito/index.htm

Certain Culex (pronounced Q-lex) mosquitoes are the main carriers (vectors) of WNv between birds, and probably to people and other animals as well. Experts generally agree that controlling these Culex mosquitoes at their source is a reasonable way to protect people from infection, disease, and death caused by this virus. A recent article highlights the increasing importance of 2 common Culex mosquitoes in Massachusetts. The abstract from this article states:

> *In the northeast United States, control of West Nile virus (WNv) vectors has been unfocused because of a lack of accurate knowledge about the roles different mosquitoes play in WNv transmission. We analyzed the risk posed by 10 species of mosquitoes for transmitting WNv to humans by using a novel risk-assessment measure that combines information on the abundance, infection prevalence, vector competence, and biting behavior of vectors. This analysis suggests that 2 species (Culex pipiens L. and Cx. restuans Theobald [Diptera: Culicidae]) not previously considered important in transmitting WNv to humans may be responsible for up to 80% of human WNV infections in this region. This finding suggests that control efforts should be focused on these species, which may reduce effects on nontarget wetland organisms. Our risk measure has broad applicability to other regions and diseases and can be adapted for use as a predictive tool of future human WNV infections.*

The entire article is at the following link (make a copy for permit holders and public)

http://www.cdc.gov/ncidod/EID/vol11no03/04-0364.htm

Culex mosquitoes develop in water within natural and artificial containers. Municipal catch basins are particularly important because they are installed throughout most communities, are designed to hold water, and often become fouled with leaf litter and other organic wastes. The stagnant water provides ideal conditions for the immature stages of these mosquitoes, and the space between the water surface and catch basin grate provides shelter for resting adults**.** Other sites, such as in clogged roof gutters and downspouts, stagnant puddles and pools, and water-containing buckets and toys will support development of these mosquitoes. Just an inch of water within a trash barrel may allow many hundreds of mosquitoes to develop each week. Although many different kinds of habitats may support and produce numerous Culex mosquitoes, municipal catch basins are likely to be major sources. Furthermore, municipal workers can conveniently treat catch basins, and these applications are cost effective, and pose insignificant environmental impact.

As a rule of thumb, Culex populations will begin to develop in early June and they become more abundant during July and August.

The objective of the Department of Agricultural Resources-Pesticide Bureau WNv Larvicide Program is to "train and permit" municipal employees so that they can legally treat catch basins with a limited selection of specifically approved products. **Treating catch basins is intended to reduce and/or delay the mosquito population buildup and consequently may protect public health. Note: Public education should be emphasized too, particularly to convince community members that they should not dump wastes in catch basins!**

See CDC link for new information that can be used by your community to Fight The Bite

http://www.cdc.gov/ncidod/dvbid/westnile/prevention_info.htm

TREATMENT TIMING IS VERY IMPORTANT

An Example of poor treatment timing
Two municipalities who chose to implement a WNV program failed to consider important factors prior to the implementation. Both municipalities treated their catch basins using larvicide briquettes effective for 30-days.

The first municipality treated much too early in the season (the month of April). Culex mosquitoes are not usually found developing until June. Because this municipality treated too early, they needlessly expended limited funds and resources, and failed to reduce Culex populations.

The second municipality treated much too late in the season (in September or October). Culex mosquitoes that develop that late in the season tend not to blood feed, but instead find shelter where they will hibernate until the following spring. By treating so late, this municipality wasted funds and resources.

More importantly, it is critical to educate the public and political leaders of any community that when human cases of WNv have been reported, larvicing may not be an effective option since the adult mosquitoes have already emerged and may be laden with virus. Thus, to produce the most meaningful effect, it is important to larvicide at the proper time of the year. Similarly, it is important to educate the public to eliminate mosquito habitats on their own properties (empty containers around homes that hold water and unclog roof drainages), reduce their chances of being bitten (maintain window screens and use repellents while outdoors), and reduce the suitability of catch basins as mosquito developmental sites (by not dumping wastes into these basins).

The following steps are recommended in the management of Culex mosquitoes in catch basins.

Step 1: Catch Basin Inspection (Function and Cleaning)

It would be prudent to inspect catch basins for proper functionality. Whenever possible, inspecting and cleaning should be completed **prior to your WNV larvicide treatment operation**.

Now is a good time to coordinate the following:

Dates of catch basin cleaning **before** larvicide operations begin.
Assignment of personnel involved in larvicide operation.
Mapping of anticipated larvicide operation.
Purchase of larvicide product (see purchase information section)
Special Larvicide Permit Renewal or obtaining a regular pesticide license
(See http://www.state.ma.us/dfa/pesticides/licensing/bulletin/index.htm)
Record keeping information
Department of Public Health Information
(See http://www.state.ma.us/dph/wnv/wnv1.htm)

Step 2: Catch Basin Inspection for mosquitoes

Although it would be time-consuming and impractical to survey all catch basins in many municipalities due to their large number, it is recommended that a small number should be checked for mosquito development **prior** to any larvicide operation to insure treatments are justified. This monitoring step is important in any Integrated Pest Management (IPM) approach. Treating catch basins with mosquito larvicides, without any monitoring, is not consistent with the principles of Integrated Pest Management. Furthermore, certain thresholds should be met or exceeded before treatment begins. Thresholds may be set at a certain minimum number of larvae per sample in a catch basin, and/or a minimum percentage of catch basins in an area that are found to contain mosquito larvae.

Prying off catch basin grates with a pry bar and scooping-out (dipping) water in the basin to determine if mosquito larvae are present can yield important information such as the population density, growth stage, and species.

Regional mosquito control districts are equipped to perform this kind of sampling. In fact, some mosquito control districts have constructed specialized catch basin water sampling tools that can be used without removing the catch basin grate. **See last page (Page 11) for diagram of what is called the "Landers Ladle" (or contact the inventor Bruce Landers, Superintendent of the Suffolk County Mosquito Control Project, page 10) for Catch Basin Sampling Design specifics.**

Municipalities that are not members of mosquito control districts may also construct and use these specialized catch basin water-sampling tools to help them make catch basin treatment decisions. If your municipality is a member of a mosquito control district or project, contact them (see page 9) about surveying catch basins and to learn the best time to implement larvicidal treatments.

A Rule Of Thumb:
Plan cleaning of catch basins early in the year (before June 1st) or after mid-August.
Larvicidal treatments are best applied between June 1st and August 1st.

Step 3: Larvicide Product Choices

Several factors should be considered when selecting a mosquito larvicide product to use in the catch basins of your municipality. From our experience, many municipalities are making their choices based on cost alone.

Please call the Department or contact your regional mosquito control project. Whereas **cost is important, the following factors should be considered to properly choose a product:**

- Desired duration of activity per treatment: Although longer acting formulations cost more per treatment, they will require fewer applications per site (thus, less labor and fuel). Consider a long acting product in June, and a shorter acting formulation later in the season.
- Presence of water in the catch basin: Certain products can be applied even in the absence of water.
- Population density of larvae in the catch basin: Are populations sufficient to justify treatment?

- Ease of application: (Some products may be too large to fit through the catch basin grate in your municipality)
- Recording treatments: A spot of colored paint, applied to the basin grate can signify treatment of that basin on a certain date and year. Select different colors for different treatments or months. Maintain a database that attests to which streets were treated, with what product, when, and by whom.

The costs of commercially available mosquito larvicides (see chart below) differ depending on their formulation and percent active ingredient. Some products are formulated with a greater amount of active ingredient (chemical responsible for the insecticide activity), which is then slowly released into the water e.g. Altosid Insect Growth Regulator. These products are formulated to release the active ingredient from 30 days up to 150 days.

PRODUCT NAME	**2008 PRODUCT COST PER CATCH BASIN**	
ALTOSID XR BRIQUETS (150-DAY)		**$2.82**
ALTOSID BRIQUETS (30-DAY)		**$0.97**
ALTOSID PELLETS (30-45 DAY)	**$24.09 per LB.**	**$0. 44**
ALTOSID WSP		**$0.68**
VECTOLEX CG	**$6.00 per LB.**	**$0.18**
VECTOLEX WSP		**$ 0.73**
BACTIMOS BRIQUETS		**$0. 79**

When reviewing product choices, the cost of product per catch basin is only one factor. You need to consider many other things such as the added cost of labor and fuel to visit each catch basin, whether the treatment may occur early or fairly late in the season, the ease of treatment (is the product size too large for the type of catch basin grate covering?), and record keeping (see examples below). **Note: Of the two (2) Altosid XR Briquet formulations, only the Altosid Ingot XR Briquet is designed to fit into a standard catch basin grate that are typically 1.25 inches to 2.5 inches wide. Note: There is a range of sizes from wheelchair safe catch basins that are found in some parks and have .5-inch openings to waffle design catch basins that can have 2.5-inch openings.**

With a little ingenuity or cleverness, the individual can determine the best product and delivery. One may consider placing 1 (30-day Altosid briquette) in a catch basin more convenient than measuring out the proper amount of Altosid pellets unless one devised a standard measuring scoop. Again, depending on individual, keeping track (record-keeping) of using one (30-day Altosid briquette) per catch basin vs. keeping track of measured 2/3 tablespoon of Altosid pellets per catch basin could be preferable. Of course, one needs to keep in mind that an Altosid briquette is double the cost of the pellets, and pellets have been shown to give 45 days effectiveness (1 ½ times as long as the briquette).

Placing one Vectolex Water Soluble Packet (WSP) in a catch basin may be more convenient than measuring/scooping out the proper amount of Vectolex CG granules. Again, depending on individual, keeping track (record-keeping) of using one pouch of Vectolex WSP per catch basin vs. keeping track of the measured granules of Vectolex CG per catch basin might help.

Note that the Vectolex product continues to provide control of any new breeding as long as the catch basin remains wet. Drying will 'kill' the product, and reflooding of the site will not reactivate this product. To take advantage of Vectolex recycling properties, it is best used when larval populations are abundant (July, August, and September). In normal seasons, catch basins generally retain water through the summer. Altosid products, in contrast, continue to be active, even after being dried.

If your municipality had the budget to cover the entire season, the extended 150-day release briquettes would be the ideal product to apply in June. Note: Some specialists have cited that this formulation may only be active for 90 days. Keep this mind and strive to monitor/do larval survey checks to determine product efficacy status. Alternatively, treat catch basins starting in June with a 30-day Altosid briquette or pellets. Thereafter, switch to a Vectolex product for July and August (if catch basins hold water). If catch basins are expected to become dry, then the Altosid briquette could be used.

RESISTANCE MANAGEMENT MESSAGE
Alternating product choices helps to reduce the chances of insect resistance in future years. This means you should consider switching products after a couple of years of using the same product (e.g. switching from Vectolex to Altosid or vice versa for the purpose of resistance management). Note: Check with a Superintendent of Mosquito Control Projects listed on page 9 and 10 for further information.

Culex Control in Catch Basins

Bti or *Bacillus thuringiensis israelensis* is a naturally occurring soil bacterium registered for control of mosquito larvae.

Products such as Bactimos briquettes or ("mosquito dunks") contain the active ingredient Bti. Although Bti is effective against mosquito larvae, **it is not as effective as the other choices in catch basin environments.**

Lastly, if you do not have the kind of budget necessary to implement comprehensive larvicide programs, consider using whatever available funding you may have and focus on treatment in late June through August 1st especially in designated areas close to sensitive populations such as nursing and convalesce homes.

Step 4: Purchase Product(s)

MASSACHUSETTS MOSQUITO CONTROL LARVICIDE CONTRACTOR LIST

1. Adapco
   2800 South Financial Court
   Sanford, FL 32773
   Contact: Ted Bean or James Barr

(Tel) 800-367-0659 (Fax) 781-939-3150

(E-mail) TBean@e/adapco.com OR jbarr@e-adapco.com

Web Address: www.e-adapco.com

2. B & G Chemicals & Equipment Co., Inc.
10539 Maybank Drive
Dallas, TX 75220
Contact: Kathy Lea

(Tel) 800-345-9387 or 214-357-5741 (FAX) 214-357-1024

(E-mail) klea@bgchem.com

Web Address: www.bgchem.com

3. Clark Mosquito Control Products
159 N. Garden Avenue
Roselle, IL 60172
Contact: Wally Terrill

(Tel) 800-323-5727 or (630) 894-2000 (Fax) 800-832-9344

(E-Mail) wallyterrill@clarkmosquito.com

Web Address: www.clarkemosquito.com

4. UNIVAR USA Inc
155 C New Boston Street
Woburn, MA 01801
Contact: George Williams Jr.

(Tel) 800-888-4897 or (781) 939-3144 (Fax) 781-939-3150

(E-mail) george.williams@univarusa.com

Web Address: www.pestweb.com

Step 5: Education
Education should be a critical component of your WNv implementation operation. Political leaders in your community should be provided this GUIDANCE or at a minimum be educated about the life cycle of the Culex mosquito and the most meaningful times to treat catch basins.

Media reports of dead crows and human illness can prompt or pressure a municipality to treat when the use of products may not be effective (refer to previous examples above). In addition, your municipality's Board of Health and/or the State Department of Public Health should be providing information to residents about:

- Arbovirus disease risks;
- Personal protection, and
- How to best avoid mosquitoes.

See CDC link for new information that can be used by your community to Fight The Bite

http://www.cdc.gov/ncidod/dvbid/westnile/prevention_info.htm

Contacts for nine (9) organized regional mosquito control

JAMES JURGENSON

Berkshire County Mosquito Control Project
19 Harris Street
Pittsfield, MA 01201
E-MAIL: bcmcp@bcn.net

Tel:(413) 447-9808
FAX: (413) 447-7185

WAYNE ANDREWS

Bristol County Mosquito Control Project
140 North Walker St.
Taunton, MA 02780
E-MAIL: brismosqwa@comcast.net

Tel: (508) 823-5253
FAX: (508)-828-1868

JOHN DOANE

Cape Cod Mosquito Control Project
86 Willow St.
Yarmouth, MA 02675
E-MAIL: ccmcp@cape.com

Tel: (508) 775-1510
FAX: (508) 362-7917

TIM DESCHAMPS

Central Massachusetts Mosquito Control Project
111 Otis St.
Northborough, MA 01532
E-MAIL: deschamps@ccmcp.org

Tel: (508) 393-3055
FAX: (508) 393-8492

DAVID HENLEY

East Middlesex Mosquito Control Project
11 Sun Street
Waltham, MA 02453
E-MAIL: emmcp.dh@verizon.net

Tel: (781) 899-5730
FAX: (781) 647-4988

WALTER MONTGOMERY

Northeastern Massachusetts Mosquito
& Wetland Management District
261 Northern Blvd. Plum Island
Newburyport, MA 01950
E-MAIL: nemmc@comcast.net

Tel:(978) 463-6630
FAX (978) 463-6631

Contacts for nine (9) organized regional mosquito control

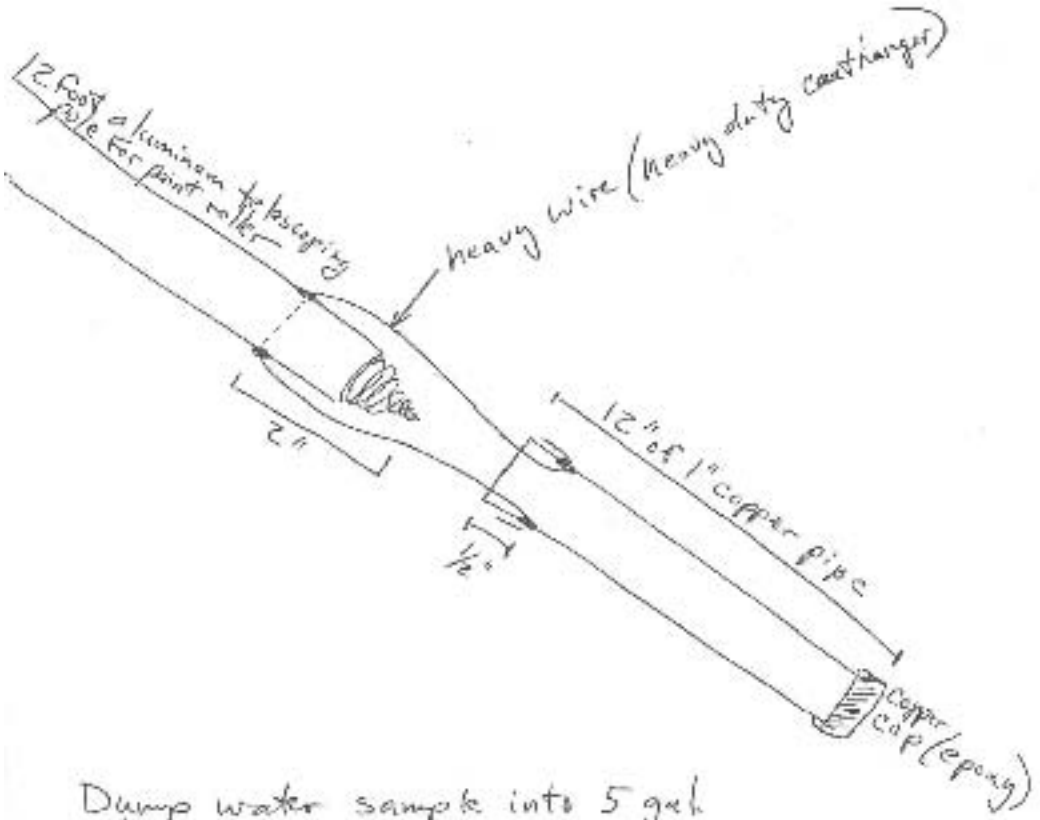
JOHN J. SMITH
Norfolk County Mosquito Control Project
34 Endicott St. Bldg. 34
Norwood, MA 02062
E-MAIL: ncmcp@attglobal.net
Tel: (781) 762-3681
FAX: (781) 769-6436

ANTHONY F. TEXEIRA
Plymouth County Mosquito Control Project
142 R Pembroke Street
PO Box 72
Kingston, MA 02364
E-MAIL: atexeira@plymouthmosquito.com.
Tel: (781) 585-5450
FAX: (781) 582-1276

BRUCE LANDERS
Suffolk County Mosquito Control Project
36 Industrial Drive
Hyde Park, MA 02136
E-MAIL: Balscmcp1974@yahoo.com
Tel: (617) 361-0550
FAX: (617) 361-4954

Catchbasin Larval Sampler
"Landers' Ladle"

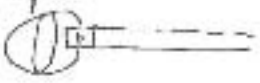
Cost: $15 in parts



Dump water sample into 5 gal white bucket.

Do not kick sand into catchbasin because mosquito larvae will hide at the bottom.

Adding wire to the rear of the telescoping pole will help prevent pole from going through grates if you lose your grip.



Basic Step-by-Step Instructions

To make a Landers Ladle, the following parts can be purchased at any of the large home retail or a local hardware store.

1. A painter's pole that is 6 feet long that can be expanded to twelve feet. The diameter of the pole should be approximately one inch.
2. A one-foot length of one-inch diameter copper pipe and a copper cap to be soldered onto one end of the pipe.
3. Drill two holes at the end of the painter's pole and drill another two holes at the end of the copper pipe without the cap.
4. Using several inches of coat hanger wire, connect the painter's pole to the copper pipe

Acknowledgements:

I am thankful to Richard Pollack, Ph. D., Harvard School of Public Health, David Henley, Superintendent of the East Middlesex Mosquito Control Project, and Steven Antunes-Kenyon, Department of Agricultural Resources for their input and thoughtful edits of this document.